

Analytical Data Package Prepared For

CH2M Hill Plateau Remediation

Radiochemical Analysis By
TestAmerica Inc

2800 G.W. Way, Richland Wa, 99354, (509)-375-3131.

Assigned Laboratory Code: TARL

Data Package Contains 22 Pages

Report No.: 67539

Results in this report relate only to the sample(s) analyzed.

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
W07271	X15-048	B32J25	J5J140411-1	M7QK81AA	9M7QK810	5288022
		B32J25	J5J140411-1	M7QK81AC	9M7QK810	5288023
		B32J25	J5J140411-1	M7QK81AD	9M7QK810	5288024
		B32J30	J5J140411-2	M7QK91AA	9M7QK910	5288022
		B32J30	J5J140411-2	M7QK91AC	9M7QK910	5288023
		B32J30	J5J140411-2	M7QK91AD	9M7QK910	5288024
	X16-011	B33BC1	J5J140410-1	M7QK71AA	9M7QK710	5288021
		B33BC1	J5J140410-1	M7QK71AC	9M7QK710	5288022
		B33BC1	J5J140410-1	M7QK71AD	9M7QK710	5288023



Certificate of Analysis

CH2M Hill Plateau Remediation Company
P.O. Box 1600
Mail Stop – R3-60
Richland, WA 99352

November 5, 2015

February 23, 2016

Attention: Scot Fitzgerald

SAF Number	:	X16-011, X15-048
Date SDG Closed	:	October 14, 2015
Number of Samples	:	Three (3)
Sample Type	:	Water
SDG Number	:	W07271
Data Deliverable	:	15-Day / Summary

CASE NARRATIVE

This report has been revised per client request from a P&D generated January 18, 2016. The U-235 was deleted from the spike results, as only U-234 and U-238 are spiked. The I-129 narrative has also been updated to include comment on the RPD. All amended information in this case narrative will be bold, underlined and italicized

I. Introduction

On October 14, 2015, three samples were received at TestAmerica (TARL). Upon receipt, the samples were assigned laboratory ID numbers to correspond with the CH2M specific IDs.

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Alpha Spectroscopy

Uranium 234, 235 and 238 by method RL-ALP-015

Gamma Spectroscopy

Iodine-129 (LL) by method RL-GAM-002

CH2M Hill Plateau Remediation Company

November 5, 2015

February 23, 2016

Liquid Scintillation Counting

Technetium-99 by TEVA method RL-LSC-014

Tritium by method RL-LSC-005

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Alpha Spectroscopy

Uranium 234, 235 and 238 by method RL-ALP-015:

No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

Gamma Spectroscopy

Iodine-129 (LL) by method RL-GAM-002:

The RPD exceeds acceptance, however, the duplicate meets the acceptance criteria specified when the results are less than five times the CRDL. Except as noted, the sample results and associated batch QC results are within contractual requirements.

Liquid Scintillation Counting

Technetium-99 by TEVA method RL-LSC-014:

No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

Tritium by method RL-LSC-005:

No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

We certify that this data package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

Reviewed and approved:

Erika Jordan

 2016.02.23

15:35:30 -08'00'

Whitney Ritari

Project Manager

Problem and Discrepancy Report**TARL****W07271****01/18/16**

The data package has the following issues:

- The LCS is out of limits for U-235 (p 12) and not discussed in the narrative.
- RPD out of limits in I-129 analysis of B33BC1 DUP (p 11); and not discussed in the narrative, both results are greater than 5 times the MDL.

Resolution: *Provide correction.***Lab Response:** **The U-235 was removed from the LCS, as it is not spiked. The case narrative was updated to note the I-129 duplicate agreement.**

Please correct the issues and submit the hard copy data package.

Provide a resolution to each issue noted on the report

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Drinking Water Method Cross References

DRINKING WATER ASTM METHOD CROSS REFERENCES		
Referenced Method	Isotope(s)	TestAmerica Richland's SOP No.
EPA 901.1	Cs-134, I-131	RL-GAM-001
EPA 900.0	Alpha & Beta	RL-GPC-001
EPA 00-02	Gross Alpha (Coprecipitation)	RL-GPC-002
EPA 903.0	Total Alpha Radium (Ra-226)	RL-RA-002
EPA 903.1	Ra-226	RL-RA-001
EPA 904.0	Ra-228	RL-RA-001
EPA 905.0	Sr-89/90	RL-GPC-003
ASTM D5174	Uranium	RL-KPA-003
EPA 906.0	Tritium	RL-LSC-005

Results in this report relate only to the sample(s) analyzed.

Uncertainty Estimation

TestAmerica Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, $R = \text{constants} * f(x,y,z,...)$. The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/\sqrt{n}), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or TestAmerica.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
CSU (#s) <i>u_c Combined Standard Uncert.</i>	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, <i>u_c the combined standard uncertainty</i> . The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or TestAmerica "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgndCnt/BkgndCntMin}) / \text{SCntMin})) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$. For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. $MDC = (4.65 * \text{Sqrt}((\text{BkgndCnt/BkgndCntMin}) / \text{SCntMin}) + 2.71 / \text{SCntMin}) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$. For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUncert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number .
RER	The equation Replicate Error Ratio = $(S - D) / [\sqrt{TPUs^2 + TPUD^2}]$ as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUD is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by TestAmerica upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

CH2MHill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
C.O.C. #
X15-048-006

Page 1 of 1

Collector	J.R. Aguilar/CHPRC	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	X15-048	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302869
Project Title	200-BP-5 Treatability Test -Day 1	Logbook No.	HNF-N-506 76/ 82	Ice Chest No.	N/A
Shipped To (Lab)	TestAmerica Incorporated, Richland	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	CERCLA	Priority:	15 Days	PRIORITY	Offsite Property No.
POSSIBLE SAMPLE HAZARDS/REMARKS			SPECIAL INSTRUCTIONS		
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/ IATA Dangerous Goods Regulations but are not releasable per DOE Order 4581.			N/A		

Sample No.	Filter *	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32J25	N	W 10-14-15	0834	2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B32J25	N	W 10-14-15	0834	1x500-mL P	TC99_ETVDSK_LSC: COMMON	6 Months	HCl to pH <2
B32J25	N	W 0834	0834	1x1-L G/P	UIISO_PLATE_AEA: COMMON M7QYQ	6 Months	HNO3 to pH <2

*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/ IATA Dangerous Goods Regulations but are not releasable per DOE Order 4581.

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55140411

WON211

Due 10-29-15



J5J140411

Relinquished By J.R. Aguilar/CHPRC	Print <i>J.R. Aguilar/CHPRC</i>	Date/Time OCT 14 2015 0910	Received By E.L. Kauer CHPRC	Print <i>E.L. Kauer CHPRC</i>	Date/Time OCT 14 2015 0910	Sign <i>E.L. Kauer CHPRC</i>	Date/Time OCT 14 2015 0910	Matrix *
Relinquished By E.L. Kauer CHPRC	Print <i>E.L. Kauer CHPRC</i>	Date/Time OCT 14 2015 0910	Received By J. Friesz, TARU	Print <i>J. Friesz, TARU</i>	Date/Time OCT 14 2015 0910	Sign <i>J. Friesz, TARU</i>	Date/Time OCT 14 2015 0910	Matrix *
Relinquished By		Date/Time	Received By		Date/Time		Date/Time	
Relinquished By		Date/Time	Received By		Date/Time		Date/Time	

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FINAL SAMPLE DISPOSITION Disposal Method (e.g. Return to customer, per lab procedure, used in process)

Disposed By

PRINTED ON 9/17/2015

FSR ID = FSR6393

A-6004-842 (REV 2)

**CH2MHill Plateau Remediation
Company**

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **X15-048-008**

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Rev 1

February 23, 2016

AMENDED REPORT

Collector	J.R. Aguilar/CHPRC	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650
SAF No.	X15-048	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302869
Project Title	200-BP-5 Treatability Test -Day 1	Logbook No.	HNF-N-506 <u>7U 82</u>	Ice Chest No.	N/A
Shipped To (Lab)	TestAmerica Incorporated, Richland	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	CERCLA	Priority:	15 Days	PRIORITY	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS

*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

Sample No.	Filter *	Date	Time	No/Type Container	Sample Analysis	Hold Time	Preservative
B32J30	N	W	10-14-15	0834	2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months
B32J30	N	W	10-14-15	0834	1x500-ml P	TC99_ETVDSK_LSC: COMMON	6 Months
B32J30	N	W	10-14-15	0834	1x1-L G/P	UIISO_PLATE_AEA: COMMON <u>MNQX9</u>	6 Months

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Relinquished By <u>J.R. Aguilar/CHPRC</u>	Print <u>J.R. Aguilar</u>	Sign <u>OCT 14 2015</u>	Date/Time <u>09:00</u>	Received By <u>E.L. Kauer</u>	Print <u>E.L. Kauer</u>	Sign <u>OCT 14 2015</u>	Date/Time <u>07:00</u>	Matrix *
Relinquished By <u>E.L. Kauer</u>	Print <u>E.L. Kauer</u>	Sign <u>OCT 14 2015</u>	Date/Time <u>14:00</u>	Received By <u>J. Friesz, TARL</u>	Print <u>J. Friesz, TARL</u>	Sign <u>OCT 14 2015</u>	Date/Time <u>14:00</u>	S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By			Date/Time	Received By		Date/Time		
Relinquished By			Date/Time	Received By		Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)							Disposed By
PRINTED ON	FSR ID = FSR6393							Date/Time
PRINTED ON	AMENDED REPORT							Date/Time
PRINTED ON	A-6004-842 (REV 2)							Date/Time

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THE LEADER IN ENVIRONMENTAL TESTING

Date/Time Received: 10-14-15 | 1420

Container GM Screen Result: (Airlock) 8 cpm Initials []
Sample GM Screen Result (Sample Receiving) 8 cpm Initials []

Client: QEW

SDG #: WD7271

SAF #: X15-048

NA []

Lot Number: J5J1404W

Chain of Custody #: X15-048-006, 008

Shipping Container ID or Air Bill Number: NA []

Samples received inside shipping container/cooler/box

Yes [] Continue with 1 through 4. Initial appropriate response.
No [] Go to 5, add comment to #16.

1. Custody Seals on shipping container intact? Yes [] No []
 2. Custody Seals dated and signed? Yes [] No []
 3. Cooler temperature: _____ °C NA []
 4. Vermiculite/packing materials is NA [] Wet [] Dry []

Item 5 through 16 for samples. Initial appropriate response.

5. Chain of Custody record present? Yes [] No []
 6. Number of samples received (Each sample may contain multiple bottles): 2
 7. Containers received: 2 x 500 mL, 2 x LP, 4 x 4LP

8. Sample holding times exceeded? NA [] Yes [] No []
 9. Samples have: tape hazard labels custody seals appropriate sample labels

10. Matrix: A (FLT, Wipe, Solid, Soil) I (Water) S (Air, Niosh 7400) T (Biological, Ni-63)

11. Samples: are in good condition are leaking are broken
have air bubbles (Only for samples requiring no head space) Other12. Sample pH appropriate for analysis requested Yes [] No [] NA []
(If acidification is necessary go to pH area & document sample ID, initial pH, amount of HNO₃ added and pH after addition on table)

13. Were any anomalies identified in sample receipt? Yes [] No []

14. Description of anomalies (include sample numbers): NA []

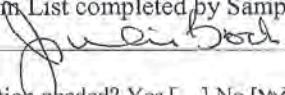
15. Sample Location, Sample Collector Listed on COC? * Yes [] No []
*For documentation only. No corrective action needed.

16. Additional Information: W/A

[] Client/Courier denied temperature check.

[] Client/Courier unpack cooler.

Sample Check-in List completed by Sample Custodian:

Signature: 

Date: 10-14-15

Client Notification needed? Yes [] No [] Date:

By: _____

Person contacted: _____

W/A No action necessary; process as is

Project Manager: Whitney M. Ritter

Date: 10/15/15

**CH2MHill Plateau Remediation
Company**

Rev 1

February 23, 2016

AMENDED REPORT

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	
		C.O.C. # X16-011-003	
		Page 1 of 1	

Collector	J.R. Aguilar/CHPRC	Contact/Requester	WATERS-HUSTED, K
SAF No.	X16-011	Sampling Origin	Hanford Site
Project Title	200-BP-5 Characterization Sampling	Logbook No.	HNF-N-506 <u>76 / 82</u>
Shipped To (Lab)	TestAmerica Incorporated, Richland	Method of Shipment	GOVERNMENT VEHICLE
Protocol	CERCLA	Priority:	15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B33BC1	N	W	10-14-15	0808	1x1-L P	906.0 TRITIUM_LSC: COMMON	6 Months	None
B33BC1	N	W	10-14-15	0808	2x4-L G/P	1129LL SEP LEPS GS LL: COMMON	6 Months	None
B33BC1	N	W	10-14-15	0808	1x500-mL P	TC99_ETVDSK_LSC: COMMON	6 Months	HCl to pH <2

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J55140410
WSO1211
Due 10-29-15



Relinquished By J.R. Aguilar/CHPRC	Print <i>J.R. Aguilar</i>	Sign <i>J.R. Aguilar</i>	Date/Time OCT 14 2015 0710	Received By E.L. Kauer CHPRC	Print <i>E.L. Kauer</i>	Sign <i>E.L. Kauer</i>	Date/Time OCT 14 2015 0710	Matrix *
Relinquished By E.L. Kauer CHPRC	Print <i>E.L. Kauer</i>	Sign <i>E.L. Kauer</i>	Date/Time OCT 14 2015 0710	Received By J. Friesz, TARL	Print <i>J. Friesz, TARL</i>	Sign <i>J. Friesz, TARL</i>	Date/Time OCT 14 2015 0710	Matrix *
Relinquished By J. Friesz, TARL	Print <i>J. Friesz, TARL</i>	Sign <i>J. Friesz, TARL</i>	Date/Time OCT 14 2015 0710	Received By W. H. Hause	Print <i>W. H. Hause</i>	Sign <i>W. H. Hause</i>	Date/Time OCT 14 2015 0710	Matrix *
Relinquished By W. H. Hause	Print <i>W. H. Hause</i>	Sign <i>W. H. Hause</i>	Date/Time OCT 14 2015 0710	Received By R. L. Johnson	Print <i>R. L. Johnson</i>	Sign <i>R. L. Johnson</i>	Date/Time OCT 14 2015 0710	Matrix *
Relinquished By R. L. Johnson	Print <i>R. L. Johnson</i>	Sign <i>R. L. Johnson</i>	Date/Time OCT 14 2015 0710	Received By Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Print Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Sign Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Date/Time Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Date/Time Disposal Method (e.g., Return to customer, per lab procedure, used in process)
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)							Date/Time Disposal Method (e.g., Return to customer, per lab procedure, used in process)
PRINTED ON 10/1/2015	FSR ID = FSR6951							Date/Time Disposal Method (e.g., Return to customer, per lab procedure, used in process)

THE LEADER IN ENVIRONMENTAL TESTING

Date/Time Received: 10-14-15 / 1420Container GM Screen Result: (Airlock) 0 cpm Initials B []
Sample GM Screen Result (Sample Receiving) 0 cpm Initials B []Client: QBW SDG #: WD7271 SAF #: X16-011 NA []Lot Number: JSS140410Chain of Custody # X16-011-003Shipping Container ID or Air Bill Number: NA [B]Samples received inside shipping container/cooler/box
Yes B [] Continue with 1 through 4. Initial appropriate response.
No [] Go to 5, add comment to #16.

1. Custody Seals on shipping container intact? Yes [] No [] No Custody Seal B []
 2. Custody Seals dated and signed? Yes [] No [] No Custody Seal B []
 3. Cooler temperature: 10.2 °C ICE NA []
 4. Vermiculite/packing materials is NA [] Wet [] Dry []

Item 5 through 16 for samples. Initial appropriate response.

5. Chain of Custody record present? Yes B [] No []
 6. Number of samples received (Each sample may contain multiple bottles): 1
 7. Containers received: 1x500mL, 1x4L, 2x4L

8. Sample holding times exceeded? NA [] Yes [] No B []
 9. Samples have: tape hazard labels B custody seals B appropriate sample labels

(10) Matrix: A (FLT, Wipe, Solid, Soil) I (Water) S (Air, Niosh 7400) T (Biological, Ni-63)11. Samples:
B are in good condition are leaking are broken
 have air bubbles (Only for samples requiring no head space) Other _____12. Sample pH appropriate for analysis requested Yes B [] No [] NA []
(If acidification is necessary go to pH area & document sample ID, initial pH, amount of HNO₃ added and pH after addition on table)13. Were any anomalies identified in sample receipt? Yes [] No B []14. Description of anomalies (include sample numbers): NA B []15. Sample Location, Sample Collector Listed on COC? * Yes B [] No []
*For documentation only. No corrective action needed.16. Additional Information: N/A[] Client/Courier denied temperature check. B [] Client/Courier unpack cooler.Sample Check-in List completed by Sample Custodian:
Signature: QBWDate: 10-14-15Client Notification needed? Yes [] No B [] Date: _____
By: _____
Person contacted: _____

No action necessary; process as is

Project Manager Whitney M. Rotari Date 10/15/15

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 67539

SDG No: W07271

Batch	Client Id Work Order	Parameter	Result +/- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5288024 UISO_PLATE_AEA									
	B32J25								
	M7QK81AD	U-234	4.22E+01	+- 6.9E+00	pCi/L	89%	3.05E-01	1.00E+00	
		U-235	1.61E+00	+- 5.3E-01	pCi/L	89%	2.04E-01	1.00E+00	
		U-238	4.31E+01	+- 7.0E+00	pCi/L	89%	3.84E-01	1.00E+00	
	B32J25 DUP								
	M7QK81AG	U-234	4.17E+01	+- 6.7E+00	pCi/L	98%	2.50E-01	1.00E+00	1.1
		U-235	1.51E+00	+- 4.9E-01	pCi/L	98%	2.15E-01	1.00E+00	6.3
		U-238	4.17E+01	+- 6.7E+00	pCi/L	98%	3.55E-01	1.00E+00	3.2
	B32J30								
	M7QK91AD	U-234	4.06E+01	+- 6.6E+00	pCi/L	87%	2.03E-01	1.00E+00	
		U-235	1.79E+00	+- 5.5E-01	pCi/L	87%	1.49E-01	1.00E+00	
		U-238	4.03E+01	+- 6.6E+00	pCi/L	87%	1.56E-01	1.00E+00	
5288022 I129LL_SEP_LEPS_GS									
	B32J25								
	M7QK81AA	I129	2.89E+00	+- 9.4E-01	pCi/L	91%	6.34E-01	1.00E+00	
	B32J30								
	M7QK91AA	I129	3.34E+00	+- 8.5E-01	pCi/L	78%	5.72E-01	1.00E+00	
	B33BC1								
	M7QK71AC	I129	2.62E+00	+- 6.1E-01	pCi/L	95%	4.74E-01	1.00E+00	
	B33BC1 DUP								
	M7QK71AG	I129	3.93E+00	+- 8.4E-01	pCi/L	95%	5.58E-01	1.00E+00	39.9
5288021 906.0_H3_LSC									
	B33BC1								
	M7QK71AA	H-3	1.23E+04	+- 5.2E+02	pCi/L	100%	2.87E+02	4.00E+02	
	B33BC1 DUP								
	M7QK71AF	H-3	1.28E+04	+- 5.4E+02	pCi/L	100%	2.88E+02	4.00E+02	4.2
5288023 TC99_ETVDSK_LSC									
	B32J25								
	M7QK81AC	Tc-99	6.23E+03	+- 1.4E+02	pCi/L	100%	9.20E+00	1.50E+01	
	B32J30								
	M7QK91AC	Tc-99	6.19E+03	+- 1.4E+02	pCi/L	100%	9.26E+00	1.50E+01	
	B33BC1								
	M7QK71AD	Tc-99	6.08E+03	+- 1.4E+02	pCi/L	100%	9.05E+00	1.50E+01	
	B33BC1 DUP								
	M7QK71AH	Tc-99	6.11E+03	+- 1.4E+02	pCi/L	100%	9.36E+00	1.50E+01	0.4
No. of Results: 19									

TestAmerica Inc RPD - Relative Percent Difference.

rptTALRchSaSum
mary2 V5.4.1
A2002

QC Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 67539

SDG No.: W07271

Batch	Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
UISO_PLATE_AEA									
5288024	BLANK QC,	M7QN81AA	U-234	1.49E-01	+- 1.6E-01	U	pCi/L	77%	1.96E-01
			U-235	-5.58E-03	+- 7.0E-02	U	pCi/L	77%	1.42E-01
			U-238	1.44E-01	+- 1.6E-01	U	pCi/L	77%	2.06E-01
5288024	LCS,	M7QN81AC	U-234	8.69E+00	+- 1.7E+00		pCi/L	94%	102%
			U-238	9.23E+00	+- 1.8E+00		pCi/L	94%	103%
I129LL_SEP_LEPS_GS									
5288022	BLANK QC,	M7QN61AA	I129	-2.67E-02	+- 3.4E-01	U	pCi/L	88%	6.13E-01
5288022	LCS,	M7QN61AC	I129	1.65E+01	+- 2.2E+00		pCi/L	94%	86%
906.0_H3_LSC									
5288021	MATRIX SPIKE, B33BC1	M7QK71AE	H-3	1.61E+03	+- 7.9E+02		pCi/L	100%	107%
5288021	BLANK QC,	M7QN51AA	H-3	1.76E+02	+- 1.5E+02	U	pCi/L	100%	3.11E+02
5288021	LCS,	M7QN51AC	H-3	2.85E+03	+- 2.4E+02		pCi/L	100%	102%
TC99_ETVDSK_LSC									
5288023	MATRIX SPIKE, B32J25	M7QK81AF	Tc-99	5.84E+02	+- 2.1E+02		pCi/L	100%	113%
5288023	BLANK QC,	M7QN71AA	Tc-99	3.64E-01	+- 4.2E+00	U	pCi/L	100%	9.04E+00
5288023	LCS,	M7QN71AC	Tc-99	9.43E+01	+- 7.0E+00		pCi/L	100%	91%
No. of Results: 13									

FORM I

SAMPLE RESULTS

Lab Name: TestAmerica Inc
Lot-Sample No.: J5J140411-1
Client Sample ID: B32J25

SDG: W072771**Report No. :** 67539**COC No. :** X15-048-006**Collection Date:** 10/14/2015 8:34:00 AM**Received Date:** 10/14/2015 2:20:00 PM**Matrix:** WATER

Parameter	Result	Qual	Count (2 s)	Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Ordered by Client Sample ID, Batch No.		
											Total Sa Size	Aliquot Size	Primary Detector
Batch: 5288022	I129LL_SEP_LEPS_GS				Work Order: M7QK81AA		Report DB ID: 9M7QK810						
I-129	2.89E+00	9.4E-01	9.4E-01		9.4E-01	6.34E-01	pCi/L	91%	(4.6)	10/30/15 12:05 p	2.0102	L	L EP4\$1
							2.88E-01	1.00E+00	(6.2)				
Batch: 5288023	TC99_ETVDSK_LSC				Work Order: M7QK81AC		Report DB ID: 9M7QK810						
Tc-99	6.23E+03	4.2E+01	1.4E+02		1.4E+02	9.20E+00	pCi/L	100%	(676.6)	10/20/15 08:37 p	0.1274	L	L SCS
							4.41E+00	1.50E+01	(86.4)				
Batch: 5288024	UISO_PLATE_AEA				Work Order: M7QK81AD		Report DB ID: 9M7QK810						
U-234	4.22E+01	2.4E+00	6.9E+00		6.9E+00	3.05E-01	pCi/L	89%	(138.4)	10/26/15 07:54 p	0.2022	L	ALP3
							1.20E-01	1.00E+00	(12.3)				
U-235	1.61E+00	4.6E-01	5.3E-01		5.3E-01	2.04E-01	pCi/L	89%	(7.9)	10/26/15 07:54 p	0.2022	L	ALP3
							7.01E-02	1.00E+00	(6.1)				
U-238	4.31E+01	2.4E+00	7.0E+00		3.84E-01	3.84E-01	pCi/L	89%	(112.3)	10/26/15 07:54 p	0.2022	L	ALP3
							1.60E-01	1.00E+00	(12.3)				

No. of Results: 5 Comments:

Ratio U-234/238 = 1.0

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FORM I
SAMPLE RESULTS

Lab Name: TestAmerica Inc
Lot-Sample No.: J5J140411-2
Client Sample ID: B32J30

SDG: W07271**Report No. :** 67539**COC No. :** X15-048-008

Collection Date: 10/14/2015 8:34:00 AM
Received Date: 10/14/2015 2:20:00 PM

Matrix: WATER

Ordered by Client Sample ID, Batch No.						
Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, Lc
Batch: 5288022	I129LL_SEP_LEPS_GS	Work Order: M7QK91AA	Report DB ID: 9M7QK910			
I-129	3.34E+00	8.5E-01	8.5E-01	5.72E-01	pCi/L	78% (5.8)
				2.25E-01	1.00E+00	10/30/15 12:07 p (7.8)
						L
Batch: 5288023	TC99_ETVDSK_LSC	Work Order: M7QK91AC	Report DB ID: 9M7QK910			
Tc-99	6.19E+03	4.2E+01	1.4E+02	9.26E+00	pCi/L	100% (668.5)
				4.44E+00	1.50E+01	10/20/15 10:42 p (86.3)
						L
Batch: 5288024	UISO_PLATE_AEA	Work Order: M7QK91AD	Report DB ID: 9M7QK910			
U-234	4.06E+01	2.3E+00	6.6E+00	2.03E-01	pCi/L	87% (200.)
				7.05E-02	1.00E+00	(12.3)
U-235	1.79E+00	4.8E-01	5.5E-01	1.49E-01	pCi/L	87% (12.)
				4.42E-02	1.00E+00	(6.5)
U-238	4.03E+01	2.3E+00	6.6E+00	1.56E-01	pCi/L	87% (257.9)
				4.77E-02	1.00E+00	(12.3)
Ratio U-234/U-238 = 1.0						

No. of Results: 5 Comments:

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Rev 1

Date: 23-Feb-16

FORM I

SAMPLE RESULTS

Lab Name: TestAmerica Inc
Lot-Sample No.: J5J140410-1
Client Sample ID: B33BC1

SDG: W07271**Report No. :** 67539**COC No. :** X16-011-003

Collection Date: 10/14/2015 8:08:00 AM
Received Date: 10/14/2015 2:20:00 PM

Matrix: WATER

Parameter	Result	Qual	Count (2 s)	Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Ordered by Client Sample ID, Batch No.	
											Total Sa Size	Aliquot Size
Batch: 5288021 H-3	906.0_H3_LSC 1.23E+04		3.7E+02	5.2E+02	Work Order: M7QK71AA		Report DB ID: 9M7QK710					
					Work Order: M7QK71AA	5.287E+02	pCi/L	100%	(42.9)	10/21/15 03:25 a		
						1.36E+02	4.00E+02	(47.4)				
Batch: 5288022 I129LL_SEP_LEPS_GS					Work Order: M7QK71AC		Report DB ID: 9M7QK710					
I129	2.62E+00		6.1E-01	6.1E-01	Work Order: M7QK71AD	4.74E-01	pCi/L	95%	(5.5)	10/30/15 09:52 a		
						2.28E-01	1.00E+00	(8.6)				
Batch: 5288023 Tc-99	TC99_ETVDSK_LSC 6.08E+03		4.1E+01	1.4E+02	Work Order: M7QK71AD	9.05E+00	pCi/L	100%	(671.6)	10/20/15 06:33 p		
						4.34E+00	1.50E+01	(86.4)				
No. of Results: 3	Comments:											

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Rev 1

Date: 23-Feb-16

FORM II

DUPLICATE RESULTS

Lab Name: TestAmerica Inc
Lot-Sample No.: J5J140411-1
Client Sample ID: B32J25 DUP

SDG: W07271
Report No. : 67539
COC No. : X15-048-006

Parameter	Result, Orig Rst	Count (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, CRDL	Report DB ID: M7QK81AG	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5288024	UISO_PLATE_AEA	2.3E+00	6.7E+00	2.50E-01	pCi/L	Report DB ID: M7QK81GR	98% (166.8)	Orig Sa DB ID: 9M7QK810 10/26/15 07:54 p (12.4)	0.2042	ALP4	
U-234	4.17E+01								L		
	4.22E+01			1.1							
U-235	1.51E+00			4.4E-01	4.9E-01	2.15E-01	1.00E+00	98% (7.)	0.2042	ALP4	
	1.61E+00			RPD	6.3		1.00E+00	(6.1)	L		
U-238	4.17E+01	2.3E+00	6.7E+00	3.55E-01	pCi/L	3.55E-01	1.00E+00	98% (117.3)	0.2042	ALP4	
	4.31E+01			RPD	3.2		1.00E+00	(12.4)	L		

Ratio U-234/238 = 1.0

Alpha Spec Result Sum = 8.5E-01

No. of Results: 3 Comments:

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Rev 1

Date: 23-Feb-16

FORM II

DUPLICATE RESULTS

Lab Name: TestAmerica Inc
Lot-Sample No.: J5J140410-1
Client Sample ID: B33BC1 DUP

SDG: W07271
Report No. : 67539
COC No. : X16-011-003

Parameter	Result, Orig Rst	Count (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5288021	906.0_H3_LSC	Work Order: M7QK71AF		Report DB ID: M7QK71FR				Orig Sa DB ID: 9M7QK710			
H-3	1.28E+04	3.8E+02	5.4E+02	2.88E+02	pCi/L	100%	(44.5)	10/21/15 06:09 a	0.00502	L	LSC8
	1.23E+04	RPD 4.2		4.00E+02			(48.)				
Batch: 5288022	I129LL_SEP_LEPS_GS	Work Order: M7QK71AG		Report DB ID: M7QK71GR				Orig Sa DB ID: 9M7QK710			
I129	3.93E+00	8.4E-01	5.58E-01	pCi/L	95%	(7.)	(9.4)	10/30/15 09:54 a	2.0025	LEP5\$1	
	2.62E+00	RPD 39.9		1.00E+00							L
Batch: 5288023	TC99_ETVDSK_LSC	Work Order: M7QK71AH		Report DB ID: M7QK71HR				Orig Sa DB ID: 9M7QK710			
Tc-99	6.11E+03	4.2E+01	1.4E+02	pCi/L	100%	(652.4)	(86.2)	10/20/15 07:35 p	0.1262	L	LSC8
	6.08E+03	RPD 0.4		1.50E+01							

No. of Results: 3 Comments:

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FORM II

BLANK RESULTS

Lab Name: TestAmerica Inc

Matrix: WATER

SDG: W07271
Report No.: 67539

Parameter	Result	Qual	Count (2 s)	CSU (2 s)	MDL, Lc	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5288024	UISO_PLATE_AEA	U	1.6E-01	1.6E-01	1.96E-01	pCi/L	77%	0.76	10/26/15 07:55 p	0.2003	L	ALP6
U-234	1.49E-01	U			6.43E-02	1.00E+00		(1.9)				
U-235	-5.58E-03	U	7.0E-02	7.0E-02	1.42E-01	pCi/L	77%	-0.04	10/26/15 07:55 p	0.2003	L	ALP6
U-238	1.44E-01	U	1.6E-01	1.6E-01	3.88E-02	1.00E+00		-0.16				
					2.06E-01	pCi/L	77%	0.7	10/26/15 07:55 p	0.2003	L	ALP6
					6.96E-02	1.00E+00		(1.8)				
<i>Ratio U-234/U-238 = 1.0</i>												
Batch: 5288021	906.0_H3_LSC				Work Order: M7QN51AA	Report DB ID: M7QN51AB						
H-3	1.76E+02	U	1.3E+02	1.5E+02	3.11E+02	pCi/L	100%	0.57	10/21/15 07:32 a	0.005	L	LSC8
					1.48E+02	4.00E+02		(2.4)				
Batch: 5288022	I129LL_SEP_LEPS_GS				Work Order: M7QN61AA	Report DB ID: M7QN61AB						
I129	-2.67E-02	U	3.4E-01	3.4E-01	6.13E-01	pCi/L	88%	-0.04	10/30/15 05:53 p	2.0125	L	LEP4\$1
					2.73E-01	1.00E+00		-0.16				
Batch: 5288023	TC99_ETVDSK_LSC				Work Order: M7QN71AA	Report DB ID: M7QN71AB						
Tc-99	3.64E-01	U	3.7E+00	4.2E+00	9.04E+00	pCi/L	100%	0.04	10/20/15 11:44 p	0.1305	L	LSC8
					4.33E+00	1.50E+01		0.17				

No. of Results: 6 Comments:

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LCS RESULTS FORM II

Lab Name: TestAmerica Inc
Matrix: WATER

SDG: W07271 Report No.: 67539

Parameter	Result	Count Error (2 s)	CSU (2 s)	MDL	Report Unit	Yield	Expected	Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 5288024	UISO_PLATE_AEA		Work Order: M7QN81AC		Report DB ID: M7QN81CS							
U-234	8.69E+00	1.1E+00	1.7E+00	2.93E-01	pCi/L	94%	8.54E+00	4.69E-02	102%	10/26/15 07:55 p	0.2014	ALP11
U-238	9.23E+00	1.1E+00	1.8E+00	3.33E-01	pCi/L	94%	8.95E+00	4.91E-02	103%	10/26/15 07:55 p	0.2014	ALP11
Batch: 5288021	906.0_H3_LSC		Work Order: M7QN51AC		Report DB ID: M7QN51CS							
H-3	2.85E+03	2.1E+02	2.4E+02	3.05E+02	pCi/L	100%	2.80E+03	8.40E+01	102%	10/21/15 08:55 a	0.00502	LSC8
Batch: 5288022	I129LL_SEP_LEPS_GS		Work Order: M7QN61AC		Report DB ID: M7QN61CS							
I129	1.65E+01	2.2E+00	2.2E+00	8.06E-01	pCi/L	94%	1.91E+01	3.09E-01	86%	10/30/15 05:54 p	2.0039	LEP5\$1
Batch: 5288023	TC99_ETVDSK_LSC		Work Order: M7QN71AC		Report DB ID: M7QN71CS							
Tc-99	9.43E+01	6.3E+00	7.0E+00	9.08E+00	pCi/L	100%	1.04E+02	6.14E-01	91%	10/21/15 12:46 a	0.1301	LSC8

No. of Results: 5 Comments:

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Rev 1

Date: 23-Feb-16

FORM II

MATRIX SPIKE RESULTS

Lab Name: TestAmerica Inc
 Lot-Sample No.: J5J140410-1, B33BC1

SDG: W07271

Report No.: 67539

Matrix: WATER

Parameter	SpikeResult, Orig Rst	Count Qual Error (2 s)	CSU (2 s)	MDCIMDA	Rpt Unit	Yield	Rec- over	Expected, Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 5288021 H-3	Work Order: M7QK71AE 1.61E+03	4.3E+02 1.23E+04	Report DB ID: M7QK71EW 7.9E+02	3.39E+02	pCi/L	Orig Sa DB ID: 9M7QK710 100%	106.96%	1.50E+03 4.51E+01	10/21/15 04:47 a	0.0043 L	906.0_H3_LSC LSC8

Number of Results: 1

Comments:

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TestAmerica Inc RER - Replicate Error Ratio = $(S-D)/[\sqrt{(\sum D_i)^2 + \sum (D_i - S)^2}]$ as defined by ICPT BOA.
 rptSTLRchMs Bias - (Result/Expected)-1 as defined by ANSI N13.30.
 V5.4.1 A2002

Rev 1

Date: 23-Feb-16

FORM II

MATRIX SPIKE RESULTS

Lab Name:	TestAmerica Inc	SDG:	W07271
Lot-Sample No.:	J5J140411-1, B32J25	Report No. :	67539
Matrix: WATER			
Parameter	SpikeResult, Orig Rst	Count Error (2 s)	CSU (2 s)
	Work Order:	Report DB ID: M7QK81AF	MDCIMDA Rpt Unit
Batch: 5288023	5.84E+02	4.3E+01	Report DB ID: M7QK81FW
Tc-99	6.23E+03	2.1E+02	8.99E+00 pCi/L

Number of Results: 1

Comments:

February 23, 2016

Parameter	SpkeResult, Orig Rst	Count Error (2 s)	CSU (2 s)	MDCIMDA	Rpt Unit	Yield	Rec- over	Expected, Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 5288023	5.84E+02	4.3E+01	Report DB ID: M7QK81AF	Orig Sa DB ID: 9M7QK810	100%	112.74%	5.18E+02	10/20/15 09:40 p	0.1309	TC99_ETVDSK_LSC	L
Tc-99	6.23E+03	2.1E+02	8.99E+00 pCi/L				2.96E+00				LSC8

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TestAmerica Inc RER - Replicate Error Ratio = $(S-D)/[\sqrt{(\sum D_i)^2 + \sum (D_i - S)^2}]$ as defined by ICPT BOA.
 rptSTLRchMs Bias - (Result/Expected)-1 as defined by ANSI N13.30.
 V5.4.1 A2002